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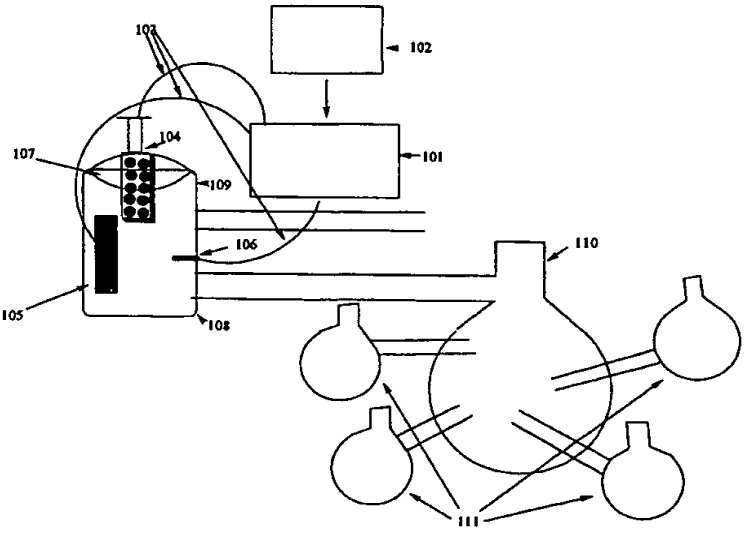

(57) Abstract

Methods and apparatus employ the use of arrays (301, 902) of two or more electronically–discrete electrodes (1, 2, 3 ...) to facilitate high–throughput preparation and testing of materials comprising two or more elements. High rates of deposition, synthesis and/or analysis of materials are achieved with the use of arrays of electrodes whereby desired materials are developed. The high rate synthesis and/or analysis of an array of materials uses deposition control techniques in conjunction with the electrode array to develop a meaningful array of materials and to analyze the materials for desired characteristics to develop one or more materials with desired characteristics. The use of an array of electrodes enables high–throughput development of materials having scientific and economic advantages.